

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

1. (Currently Amended) A method for constructing a packet comprising:  
receiving a request to construct one packet, including information on at least one header and a payload to include in the packet;  
generating the at least one header for the received request;  
writing the generated at least one header in a first queue;  
requesting the payload to include in the packet;  
writing the received payload to a second queue;  
reading the generated at least one header and payload from the first and second queues;  
and  
including the read at least one header and payload in the packet.[[.]]
2. (Original) The method of claim 1, further comprising:  
transmitting the constructed packet to a target node.
3. (Original) The method of claim 1, further comprising:  
signaling header complete in response to writing one header to the first queue; and  
signaling payload complete in response to writing the payload to the second queue.
4. (Original) The method of claim 3, wherein the at least one header and payload are included in the packet in response to receiving signals that all headers for the packet to construct are written to the first queue and the payload for the packet to construct is written to the second queue.
5. (Original) The method of claim 4, wherein writing the header and signaling header complete are performed by a header engine, wherein writing the received payload and signaling payload complete are performed by a payload engine, and wherein including the read

at least one header and payload in the packet are performed by a completion engine in response to receiving the signals.

6. (Original) The method of claim 1, wherein headers and payload for a first packet may be buffered in the first and second queues before a second packet preceding the first packet is constructed.

7. (Original) The method of claim 1, further comprising:  
in response to constructing one packet, determining whether all headers and payload for a next packet according to a packet ordering are buffered in the first and second queues; and  
constructing the next packet in response to determining that all headers and payload for the next packet are buffered in the first and second queues.

8. (Original) The method of claim 1, further comprising:  
accessing the payload from a system memory in response to receiving the request, wherein the accessed payload is written to the second queue.

9. (Currently Amended) The method of claim 1, wherein writing the at least one header to the first queue, writing the payload to the second queue, and reading the at least one header and payload from the first and second queues are performed in different clock domains.

10. (Original) The method of claim 9 , wherein headers are written to the first queue in a first clock domain, payloads are written to the second queue in a second clock domain, and headers and payloads are read from the first and second queues, respectively, in a third clock domain.

11. (Original) The method of claim 1, further comprising:  
queueing a work request including the request to construct the packet in a send queue that is in one of a plurality of queue pairs, wherein each queue pair includes one send queue and one receive queue; and

interpreting the work request to determine the at least one header and payload for the packet to construct, wherein the determined at least one header is generated and the determined payload is requested.

12. (Original) The method of claim 1, wherein one packet to construct may include at least one header and no payload, and wherein the at least one generated header is included in the packet in response to receiving signals indicating that the headers have been generated and determining that the packet to construct does not include payload.

13. (Original) A channel adaptor, wherein the channel adaptor includes logic to enable the channel adaptor to perform:

receive a request to construct one packet, including information on at least one header and a payload to include in the packet;

generate the at least one header for the received request;

write the generated at least one header in a first queue;

request the payload to include in the packet;

write the received payload to a second queue;

read the generated at least one header and payload from the first and second queues; and include the read at least one header and payload in the packet.

14. (Original) The channel adaptor of claim 13, wherein the channel adaptor logic is further capable of causing the channel adaptor to perform:

transmitting the constructed packet to a target node.

15. (Original) The channel adaptor of claim 13, wherein the channel adaptor logic is further capable of causing the channel adaptor to perform:

signaling header complete in response to writing one header to the first queue; and signaling payload complete in response to writing the payload to the second queue.

16. (Original) The channel adaptor of claim 15, wherein the at least one header and payload are included in the packet in response to receiving signals that all headers for the packet

to construct are written to the first queue and the payload for the packet to construct is written to the second queue.

17. (Original) The channel adaptor of claim 16, further comprising:
  - a header engine to perform the operations of writing the header and signaling header complete;
  - a payload engine to perform the operations of writing the received payload and signaling payload complete; and
  - a completion engine to perform the operations of including the read at least one header and payload in the packet in response to receiving the signals.

18. (Original) The channel adaptor of claim 13, wherein headers and payload for a first packet may be buffered in the first and second queues before a second packet preceding the first packet is constructed.

19. (Original) The channel adaptor of claim 13, wherein the channel adaptor logic further enables the channel adaptor to perform:
  - in response to constructing one packet, determining whether all headers and payload for a next packet according to a packet ordering are buffered in the first and second queues;
  - constructing the next packet in response to determining that all headers and payload for the next packet are buffered in the first and second queues.

20. (Original) The channel adaptor of claim 13, wherein the channel adaptor logic further enables the channel adaptor to perform:

accessing the payload from a system memory in response to receiving the request, wherein the accessed payload is written to the second queue.

21. (Currently Amended) The channel adaptor of claim 13, wherein writing the at least one header to the first queue, writing the payload to the second queue, and reading the at least one header and payload from the first and second queues are performed in different clock domains.

22. (Original) The channel adaptor of claim 21 , wherein headers are written to the first queue in a first clock domain, payloads are written to the second queue in a second clock domain, and headers and payloads are read from the first and second queues, respectively, in a third clock domain.

23. (Currently Amended) The channel adaptor of claim [[12]] 13, wherein the channel adaptor logic is further capable of causing the channel adaptor to perform:

queueing a work request including the request to construct the packet in a send queue that is in one of a plurality of queue pairs, wherein each queue pair includes one send queue and one receive queue; and

interpreting the work request to determine the at least one header and payload for the packet to construct, wherein the determined at least one header is generated and the determined payload is requested.

24. (Currently Amended) A system, comprising:

a host processor;

a magnetic storage medium;

a memory in communication with the host processor and including a payload to transmit in a packet, wherein a copy of the payload is stored in the magnetic storage medium; and

a channel adaptor in communication with the memory, wherein the channel adaptor includes logic to enable the channel adaptor to perform:

[[(i)]] receiving a request to construct one packet, including information on at least one header and a payload to include in the packet;

[[(ii)]] generating the at least one header for the received request;

[[(iii)]] writing the generated at least one header in a first queue;

[[(iv)]] requesting the payload to include in the packet;

[[(v)]] writing the received payload to a second queue;

[[(vi)]] reading the generated at least one header and payload from the first and second queues; and

[[(vii)]] including the read at least one header and payload in the packet.

25. (Original) The system of claim 24, wherein headers and payload for a first packet may be buffered in the first and second queues before a second packet preceding the first packet is constructed.

26. (Original) The system of claim 25, wherein the channel adaptor logic further enables the channel adaptor to perform:

in response to constructing one packet, determining whether all headers and payload for a next packet according to a packet ordering are buffered in the first and second queues;

constructing the next packet in response to determining that all headers and payload for the next packet are buffered in the first and second queues.

27. (Currently Amended) An article of manufacture comprising at least one of a hardware device having hardware logic and a computer readable storage medium having code for constructing a packet, wherein the article of manufacture is capable of causing and performing operations to be performed, the operations comprising:

receiving a request to construct one packet, including information on at least one header and a payload to include in the packet;

generating the at least one header for the received request;

writing the generated at least one header in a first queue;

requesting the payload to include in the packet;

writing the received payload to a second queue;

reading the generated at least one header and payload from the first and second queues; and

including the read at least one header and payload in the packet.

28. (Original) The article of manufacture of claim 27, wherein the operations further comprise:

transmitting the constructed packet to a target node.

29. (Original) The article of manufacture of claim 27, wherein the operations further comprise:

signaling header complete in response to writing one header to the first queue; and  
signaling payload complete in response to writing the payload to the second queue.

30. (Original) The article of manufacture of claim 29, wherein the at least one header and payload are included in the packet in response to receiving signals that all headers for the packet to construct are written to the first queue and the payload for the packet to construct is written to the second queue.

31. (Original) The article of manufacture of claim 30, wherein writing the header and signaling header complete are performed by a header engine, wherein writing the received payload and signaling payload complete are performed by a payload engine, and wherein including the read at least one header and payload in the packet are performed by a completion engine in response to receiving the signals.

32. (Original) The article of manufacture of claim 27, wherein headers and payload for a first packet may be buffered in the first and second queues before a second packet preceding the first packet is constructed.

33. (Original) The article of manufacture of claim 27, wherein the operations further comprise:

in response to constructing one packet, determining whether all headers and payload for a next packet according to a packet ordering are buffered in the first and second queues; and

constructing the next packet in response to determining that all headers and payload for the next packet are buffered in the first and second queues.

34. (Original) The article of manufacture of claim 27, wherein the operations further comprise:

accessing the payload from a system memory in response to receiving the request, wherein the accessed payload is written to the second queue.

35. (Original) The article of manufacture of claim 27, wherein writing the at least one header to the first queue, writing the payload to the second queue, and reading the at least one header and payload from the first and second queues are performed in different clock domains.

36. (Original) The article of manufacture of claim 35, wherein headers are written to the first queue in a first clock domain, payloads are written to the second queue in a second clock domain, and headers and payloads are read from the first and second queues, respectively, in a third clock domain.

37. (Original) The article of manufacture of claim 27, wherein the operations further comprise:

queueing a work request including the request to construct the packet in a send queue that is in one of a plurality of queue pairs, wherein each queue pair includes one send queue and one receive queue; and

interpreting the work request to determine the at least one header and payload for the packet to construct, wherein the determined at least one header is generated and the determined payload is requested.

38. (Original) The article of manufacture of claim 27, wherein one packet to construct may include at least one header and no payload, and wherein the at least one generated header is included in the packet in response to receiving signals indicating that the headers have been generated and determining that the packet to construct does not include payload.